

ABSTRACT OF THE DISCLOSURE

A digital data system comprises a plurality of links for passing messages between nodes, which may be end points such as memory or processing units, or
5 intermediate or branch points such as routers or other devices in the system. A link level flow control is implemented by control symbols passed between adjacent nodes on a link to efficiently regulate message burden on the link. The control symbols may be embedded within a message packet to quickly effect control on a link- such as reducing data flow, requesting retransmission of corrupted data, or other intervention-
10 without disruption of the ongoing packet reception. A control symbol may be recognized within the packet by a flag bit, a marker such as a transition in a signal, or a combination of characteristics. The control symbol may be a short word, having a control action identifier code at defined bit positions to indicate the desired link-level control function. A node receiving the control symbol implements the designated
15 control action while maintaining packet order data (such as bit positions and byte counts), and applying message housekeeping processing (such as error checking) as though the control symbol were absent. The control symbol is thus embedded in a manner such that a receiving node need not receive a complete message, or even a complete packet, before acting on the control symbol. The beginning and end of the interrupted packet, meanwhile, are handled as a single message packet, and are
20 processed by the receiving node in properly-aligned bit positions, allowing message flow to continue along the link without interruption. Thus, retransmission of the affected packet or message is not required. The result is that control operations dictated by the embedded control symbol are effected immediately and without
25 slowing down communications.